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## WHAT IS CLAIMED IS:

- 1. A method for purifying viruses from solution, the method comprising:
- 2 (a) combining the solution with an anionic polyelectrolyte;
- 3 (b) combining the solution with a cationic polyelectrolyte; and
- 4 (c) centrifuging the solution to obtain a supernatant and a pellet, wherein the pellet comprises the virus.
- 1 2. The method of claim 1, wherein the anionic polyelectrolyte is selected from the group consisting of glycosaminoglycans and polysaccharides.
- 1 3. The method of claim 2, wherein the glycosaminoglycans and polysaccharides are sulfated.
  - 4. The method of claim 1, wherein the anionic polyelectrolyte is selected from the group consisting of chondroitin sulfates, heparin, heparan sulfate, keratan sulfate, carrageenans, fucoidan, poly-L-glutamic acid, poly-L-aspartic acid, poly(glycolic acid), poly(lactic acid), and poly(lactic-co-glycolic acid).
- 5. The method of claim 4, wherein the anionic polyelectrolyte is chondroitan sulfate C.
- 6. The method of claim 1, wherein the cationic polyelectrolyte is a cationic polymer that complexes with the anionic polyelectrolyte.
- 7. The method of claim 1, wherein the cationic polyelectrolyte is selected from the group consisting of (diethylamino)ethyl dextran, histones, protamine, poly-L-arginine, poly-L-histidine, and poly-L-lysine.
- 8. The method of claim 1, wherein the cationic polyelectrolyte is hexadimethrine bromide.
- 9. The method of claim 1, wherein the solution further comprises proteoglycans.

- 1 10. The method of claim 1, further comprising separating the pellet from the supernatant, and 2 then resuspending the pellet in a resuspension buffer.
- 1 11. The method of claim 10, wherein the volume of the resuspension buffer is no greater than 2 one-tenth the volume of the solution, thereby resulting in at least a ten-fold concentration 3 of the virus.
- 1 12. The method of claim 10, wherein the volume of the resuspension buffer is no greater than
  2 one-hundredth the volume of the solution, thereby resulting in at least a one-hundred-fold
  3 concentration of the virus.
- 1 13. The method of claim 10, wherein the resuspension buffer comprises phosphate-buffered saline.
- 14. The method of claim 10, wherein the resuspension buffer comprises cell culture medium.
- 1 15. The method of claim 10, wherein the resuspension buffer comprises a pharmaceutically acceptable carrier.
- 1 16. The method of claim 1, wherein the virus is a retrovirus.
- 1 17. The method of claim 1, wherein the virus is an enveloped virus.
- 1 18. The method of claim 1, wherein the virus is selected from the group consisting of human
- 2 immunodeficiency virus, lentiviruses, Moloney murine leukemia virus, herpes simplex
- virus, Epstein-Barr virus, human cytomegalovirus, influenza viruses, poxviruses, and
   alphaviruses.
- 1 19. The method of claim 1, wherein steps (a) and (b) are carried out in reverse order.
- 1 20. The method of claim 1, wherein steps (a) and (b) are carried out simultaneously.

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- 1 21. A method for preparing a formulation for administering a nucleic acid molecule to a
- 2 patient, the method comprising:
- 3 (a) obtaining a solution comprising a virus that comprises a nucleic acid molecule to be
- 4 administered to a patient;
- 5 (b) combining the solution with an anionic polyelectrolyte;
- 6 (c) combining the solution with a cationic polyelectrolyte;
- 7 (d) centrifuging the solution to obtain a supernatant and a pellet, wherein the pellet
- 8 comprises the virus;
- 9 (e) separating the supernatant from the pellet; and
- (f) resuspending the pellet in a resuspension buffer suitable for injection into a patient to
- prepare a formulation for administering a nucleic acid to a patient.
- 1 22. The method of claim 21, further comprising:
  - (g) separating the virus from the polyelectrolytes.
- 1 23. The method of claim 21, wherein steps (a) and (b) are carried out in reverse order.
- 1 24. The method of claim 21, wherein steps (a) and (b) are carried out simultaneously.
- 1 25. An assay method for detecting the presence of a virus in a sample, the method comprising:
- 3 (a) obtaining a sample to be assayed for the presence of a virus;
- 4 (b) combining the sample with an anionic polyelectrolyte;
- 5 (c) combining the sample with a cationic polyelectrolyte:
- 6 (d) centrifuging the sample to obtain a supernatant and a pellet, wherein the pellet
- 7 comprises the virus, if any; and
- 8 (e) assaying the pellet for the presence of the virus.
- 1 26. The assay method of claim 25, further comprising:
- 2 (f) resuspending the pellet in a buffer solution.

- 1 27. The assay method of claim 25, further comprising:
- 2 (f) separating the virus from the polyelectrolytes.
- 1 28. The method of claim 25, wherein steps (a) and (b) are carried out in reverse order.
- 1 29. The method of claim 25, wherein steps (a) and (b) are carried out simultaneously.
- 1 30. A kit for use in concentrating or purifying viruses, the kit comprising:
- a tube of a suitable size and shape for use in a centrifuge;
- an anionic polyelectrolyte; and
- 4 a cationic polyelectrolyte.
- 1 31. The kit of claim 30, further comprising instructions for use.
- 1 32. The kit of claim 30, wherein both polyelectrolytes are supplied in a single tube.
- 1 33. The kit of claim 30, wherein the anionic polyelectrolyte and the cationic polyelectrolyte are supplied in two separate tubes.